

In the Claims:

Listing of all claims:

- 1 1. (Currently Amended) A welding, cutting or heating
2 power source capable of receiving a range of input voltages,
3 comprising:
4 an input rectifier configured to receive an ac input
5 and providing a first dc signal;
6 a boost stage configured to receive the first dc signal
7 and providing a boosted second dc signal;
8 an inverter configured to receive the second dc signal
9 and providing a second ac signal and configured to receive
10 at least one control input;
11 an output transformer configured to receive the second
12 ac signal and providing a third ac signal having a current
13 suitable for welding;
14 an output circuit configured to receive the third ac
15 signal and providing a welding, heating or cutting signal;
16 a controller configured to provide at least one control
17 signal to the inverter; and
18 an auxiliary power controller circuit configured to
19 receive a range of input voltages and providing a control
20 power signal to the controller.

2-24. (Cancelled.)

- 1 25. (New) A welding, cutting or heating
2 system capable of receiving a range of input voltages
3 spanning at least two input utility voltages, comprising:
4 an input circuit configured to receive any input
5 voltage within the range of input voltages, and configured
6 to provide a first dc signal;

7 a converter configured to receive the first dc
8 signal and to provide a converter output, and configured to
9 receive at least one control input;

10 an output circuit configured to receive the
11 converter output and to provide a welding, heating or
12 cutting signal; and

13 a controller, including a power factor correction
14 circuit, configured to provide at least one control signal
15 to the converter.

1 26. (New) The system of claim 25, further
2 comprising an auxiliary power source configured to receive any
3 voltage within the range of input voltages and configured to
4 provide a control power signal to the controller.

1 27. (New) The system of claim 26, wherein the
2 auxiliary power controller is capable of providing the control
3 power signal at a preselected control signal voltage, regardless
4 of the magnitude of the input voltage.

1 28. (New) The system of claim 27, wherein the
2 output circuit further comprises a pulsed transformer.

1 29. (New) The system of claim 28, wherein the
2 convertor includes a boost circuit.

1 30. (New) The system of claim 29, wherein the
2 output circuit includes a pulse width modulator connected to the
3 transformer.

1 31. (New) The system of claim 30, wherein the
2 range of input voltages spans at least a factor of two.

1 32. (New) A method of providing welding,
2 cutting or heating current from a range of input voltages
3 spanning at least two input utility voltages, comprising:
4 receiving the input voltage and converting it to a
5 first dc bus having a voltage magnitude higher than the
6 input voltage;
7 controlling the converting, including power factor
8 correcting by controlling a switch; and
9 receiving the dc bus and providing in response
10 thereto an output current having an output magnitude
11 suitable for a welding, heating or cutting.

1 33. (New) The method of claim 32, wherein
2 converting includes rectifying.

1 34. (New) The method of claim 32, further
2 comprising deriving auxiliary power from any voltage within the
3 range of input voltages and providing the derived power as a
4 power signal to a controller.

1 35. (New) The method of claim 34, wherein
2 providing the derived power includes providing the derived power
3 at a preselected control signal voltage, regardless of the
4 magnitude of the input voltage.

1 36. (New) The method system of claim 34, wherein
2 providing in response thereto includes pulsing a transformer.

1 37. (New) The method of claim 36, wherein
2 converting includes boost converting.

1 38. (New) The method of claim 37, wherein
2 providing in response thereto further comprises pulse width
3 modulating the transformer.

1 39. (New) The method of claim 38, wherein the
2 range of input voltages spans at least a factor of two.

1 40. (New) The method of claim 38 wherein providing
2 in response thereto further comprises rectifying the output of
3 the transformer.

1 41. (New) A welding, cutting or heating
2 system capable of receiving a range of input voltages
3 spanning at least two input utility voltages, comprising:

4 input means for receiving any input voltage within
5 the range of input voltages, and for providing a first dc
6 signal;

7 converter means for receiving the first dc signal
8 and providing a converter output in response to at least one
9 control input;

10 output means for receiving the converter output
11 and providing a welding, heating or cutting signal; and

12 control means for controlling, including power
13 factor correcting, the converter means, connected to the
14 converter means.

1 42. (New) The system of claim 41, further
2 comprising auxiliary power means for providing a control power
3 signal to the controller in response to receiving any voltage
4 within the range of input voltages.

1 43. (New) The system of claim 41, wherein the
2 auxiliary power means is further for providing the control power
3 signal at a preselected control signal voltage regardless of the
4 magnitude of the input voltage.

1 44. (New) The system of claim 41, wherein the
2 output means further comprises means for pulsing a transformer.

1 45. (New) The system of claim 44, wherein the
2 convertor means includes means for boosting a voltage.

1 46. (New) The system of claim 44, wherein the
2 output means further includes means for pulse width modulating
3 the transformer.

1 47. (New) The system of claim 41, wherein the
2 range of input voltages spans at least a factor of two.

1 48. (New) A power source for welding, cutting
2 or heating current, comprising:

3 means for receiving and converting an input
4 voltage from a range of input voltages spanning at least two
5 input utility voltages to a first dc bus having a voltage
6 magnitude higher than the input voltage;

7 means for controlling the means for receiving and
8 converting, including means for power factor correcting by
9 controlling a switch, connected to the means for receiving
10 and converting; and

11 means for receiving the dc bus and providing in
12 response thereto an output current having an output
13 magnitude suitable for a welding, heating or cutting.

1 49. (New) The power source of claim 48, wherein
2 the means for receiving and converting includes means for
3 rectifying.

1 50. (New) The power source of claim 48, further
2 comprising means for deriving auxiliary power from any voltage

3 within the range of input voltages and providing the derived
4 power as a power signal to the means for controlling.

1 51. (New) The power source of claim 48, wherein
2 the means for deriving power includes means for providing the
3 derived power at a preselected control signal voltage, regardless
4 of the magnitude of the input voltage.

1 52. (New) The power source of claim 51, wherein
2 the means for receiving and converting includes means for boost
3 converting to provide the first dc bus.

1 53. (New) The power source of claim 48, wherein
2 the range of input voltages spans at least a factor of two.

1 54. (New) A welding, cutting or heating
2 system capable of receiving a range of input voltages
3 spanning at least two input utility voltages, comprising:

4 a power circuit comprising an input circuit, a
5 converter and an output circuit, wherein the power circuit
6 is capable of providing a welding cutting or heating output
7 without reconfiguring a power circuit;

8 wherein the input circuit is configured to receive
9 any input voltage within the range of input voltages, and
10 configured to provide a first dc signal;

11 wherein the converter includes a boost circuit and
12 is configured to receive and boost the first dc signal and
13 to provide a converter output, and configured to receive at
14 least one control input;

15 wherein the output circuit is configured to
16 receive the converter output and to provide the welding,
17 heating or cutting signal; and

18 a controller, including a power factor correction
19 circuit, configured to provide at least one control signal
20 to the converter.

1 55. (New) The system of claim 54, further
2 comprising an auxiliary power circuit configured to receive any
3 voltage within the range of input voltages and configured to
4 provide a control power signal to the controller.

1 56. (New) The system of claim 54, wherein the
2 output circuit further comprises a pulsed transformer.

1 57. (New) The system of claim 56, wherein the
2 output circuit includes a pulse width modulator connected to the
3 transformer.

1 58. (New) A method of providing welding,
2 cutting or heating current from a range of input voltages
3 spanning at least two input utility voltages, comprising:
4 receiving the input voltage and converting it to a
5 first dc bus having a voltage magnitude higher than the
6 input voltage, without reconfiguring a power circuit;
7 controlling the converting, including power factor
8 correcting by controlling a switch; and
9 receiving the dc bus and providing in response
10 thereto an output current having an output magnitude
11 suitable for a welding, heating or cutting.

1 59. (New) The method of claim 58, wherein
2 converting includes rectifying.

1 60. (New) The method of claim 59, further
2 comprising deriving auxiliary power from any voltage within the

3 range of input voltages and providing the derived power as a
4 power signal to a controller.

1 61. (New) The method system of claim 60, wherein
2 providing in response thereto includes pulsing a transformer.

1 62. (New) The method of claim 58, wherein the
2 range of input voltages spans at least a factor of two.

1 63. (New) A welding, cutting or heating
2 system capable of receiving a range of input voltages
3 spanning at least two input utility voltages, comprising:
4 input means for receiving any input voltage within
5 the range of input voltages, and for providing a first dc
6 signal;

7 converter means for receiving and boosting the
8 first dc signal and providing a converter output in response
9 to at least one control input without reconfiguring a power
10 circuit;

11 output means for receiving the converter output
12 and providing a welding, heating or cutting signal; and

13 control means for controlling, including power
14 factor correcting, the converter means, connected to the
15 converter means.

1 64. (New) The system of claim 63, further
2 comprising auxiliary power means for providing a control power
3 signal to the controller in response to receiving any voltage
4 within the range of input voltages.

1 65. (New) The system of claim 63, wherein the
2 output means further comprises means for pulsing a transformer.

1 66. (New) The system of claim 63, wherein the
2 range of input voltages spans at least a factor of two.

1 67. (New) A welding, cutting or heating
2 system capable, comprising:

3 a power circuit comprising an input circuit, a
4 converter and an output circuit, wherein the power circuit
5 is capable of providing a welding cutting or heating output;
6 wherein the input circuit is configured to receive
7 at least one input voltage, and provide a converter input
8 signal to the converter;

9 wherein the converter includes a boost circuit and
10 is configured to receive and boost the converter input
11 signal and to provide a dc bus output, and configured to
12 receive at least one control input;

13 wherein the output circuit is configured to
14 receive the dc bus, and to provide the welding, heating or
15 cutting signal;

16 a controller, including a power factor correction
17 circuit, configured to provide at least one control signal
18 to the converter; and

19 an auxiliary power circuit configured to receive
20 any voltage within a range of input voltages spanning at
21 least two utility voltages, and configured to provide a
22 control power signal to the controller.

1 68. (New) The system of claim 67, wherein the
2 output circuit further comprises a pulsed transformer.

1 69. (New) A method of providing welding,
2 cutting or heating current comprising:

3 receiving the input voltage and converting it to a
4 first dc bus having a voltage magnitude higher than the
5 input voltage;

6 controlling the converting, including power factor
7 correcting by controlling a switch;

8 receiving the dc bus and providing in response
9 thereto an output current having an output magnitude
10 suitable for a welding, heating or cutting; and

11 deriving auxiliary power from any voltage within a
12 range of input voltages spanning at least two utility
13 voltages, and providing the derived power as a power signal
14 to a controller.

1 70. (New) The method of claim 69, wherein
2 converting includes rectifying.

1 71. (New) The method of claim 70, wherein the
2 range of input voltages spans at least a factor of two.

1 72. (New) A welding, cutting or heating
2 system, comprising:

3 input means for receiving any input voltage within
4 the range of input voltages, and for providing a first dc
5 signal;

6 converter means for receiving and boosting the
7 first dc signal and providing a converter output in response
8 to at least one control input;

9 output means for receiving the converter output
10 and providing a welding, heating or cutting signal;

11 control means for controlling, including power
12 factor correcting, the converter means, connected to the
13 converter means; and

14 auxiliary power means for providing a control
15 power signal to the controller in response to receiving any
16 voltage within a range of input voltages spanning at least
17 two utility voltages.

1 73. (New) The system of claim 72, wherein the
2 range of input voltages spans at least a factor of two.

1 74. (New) A welding, cutting or heating power
2 source capable of receiving a range of input voltages,
3 comprising:

4 an input rectifier configured to receive an ac
5 input, wherein the range includes a highest magnitude and a
6 lowest magnitude, and wherein the highest magnitude is at
7 least twice the lowest magnitude, and wherein the rectifier
8 is configured to provide a first dc signal;

9 a boost converter connected to receive the first
10 dc signal and provide a second dc output across positive bus
11 and a negative bus, wherein the boost converter is
12 configured to receive at least one control input, and
13 wherein the boost converter includes a boost inductor having
14 a first end in electrical communication with the rectifier,
15 and the boost inductor has a second end in electrical
16 communication with a switch, wherein when the switch is
17 closed the second end is in electrical communication with
18 negative bus, and wherein the second end is in electrical
19 communication with a diode, and the diode is further in
20 electrical communication with the positive bus, such that
21 current can flow from the second end through the diode to
22 the positive bus;

23 a pulse width modulator connected to receive the
24 dc bus and provide a pulsed signal;

25 an output transformer, having a primary connected
26 to receive the pulsed signal and to provide an output signal
27 having a current suitable for welding or cutting on a
28 secondary;

29 a controller, including a power factor correction
30 circuit, configured to provide at least one control signal
31 to the converter; and

32 an auxiliary power source capable of providing a
33 control power signal at a preselected control signal
34 voltage, for a plurality of input voltages.

1 75. (New) A method of providing welding,
2 cutting or heating power from a range of input voltages,
3 comprising:

4 rectifying an ac input, wherein the range includes
5 a highest magnitude and a lowest magnitude, and wherein the
6 highest magnitude is at least twice the lowest magnitude,
7 and wherein the rectifier is configured to provide a first
8 dc signal;

9 boost converting the first dc signal to a second
10 dc output across a negative and positive bus, including
11 receiving at least one control input, and boosting through a
12 boost inductor having a first end in electrical
13 communication with a rectifier, and a second end in
14 electrical communication with a switch, wherein when the
15 switch is closed the second end is in electrical
16 communication with negative bus, and wherein the second end
17 is in electrical communication with a diode, and the diode
18 is further in electrical communication with the positive
19 bus, such that current can flow from the second end through
20 the diode to the positive bus;

21 pulse width modulating the dc bus to provide a
22 pulsed signal;

23 transforming the pulsed signal to provide an
24 output signal having a current suitable for welding or
25 cutting;

26 controlling the boost converting to power factor
27 correct; and

28 providing auxiliary power at a control power
29 signal at a preselected control signal voltage, for a
30 plurality of input voltages.